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## EARLY TRANSPORTATION ON THE MISSISSIPPI

Before the introduction of the steamboat, the development of means of transportation on the Mississippi River proceeded along three distinct lines. The first two of these were based, respectively, upon the Indian canoe and the raft. The various modifications of these two simple crafts may well be considered as distinctively western products, as the forms which they took resulted from the peculiar conditions of the rivers in the Mississippi system. The third type, based upon the river- and ocean-going craft of the Atlantic seaboard, did not appear until after the region began to be fairly well settled, at a time when there was enough surplus produce to warrant boat-load shipments to the West Indies and to the Atlantic ports. This type, although of Eastern origin, underwent many modifications in order the better to adapt it to its intended use, and may therefore be treated in connection with the two strictly western types.

The only means of water transportation with which the Indian of the Mississippi Valley was equipped before the influence of the Frenchman was felt in the West were canoes made of logs, birch bark, or buffalo skins. The birch-bark canoe, obtained from the Indian or constructed according to his pattern, meant much to the early Frenchman in this western valley. Important as it was to the explorer, however, its limited capacity prevented its permanent use by the trader. As soon as increased settlement made commerce possible, fire and stone axes gave place to iron tools, and larger and better boats supplanted the canoes.

The earliest improvement on the canoe was the pirogue,<sup>1</sup> which was first used extensively by the early French traders.<sup>2</sup> Like the log canoe, the pirogue was constructed from the solid

<sup>1</sup> Variously spelled "pirogue," "pirog," "perrogue," "pirogua."

<sup>2</sup> Gould, in his *Fifty Years on the Mississippi*, says that it is very doubtful if we can credit the use of the first pirogue in the Mississippi Valley to the Frenchmen. He agrees that it is a European rather than an Indian invention, but he says that the early Spanish explorers were the first to use it here. Gould

trunk of a tree, the sycamore being the tree most often used for this purpose. The method of construction was as follows: After the trunk of the tree had been hollowed out, the canoe thus formed was split along its entire length as nearly in the middle as possible. Then a broad, flat piece of timber was inserted between these halves and the ends were fitted with similar planks. The chinks were plastered up with clay or filled with gum-resin.<sup>3</sup>

As this pirogue presented the same objections as the log canoe, being heavy, unwieldy, and having flat ends which met with great resistance from the water, it was further modified in time into the form of a batteau. This change was brought about by tapering the ends. Sometimes the middle was widened like a large skiff.<sup>4</sup> The tapered ends, together with the use of lighter timbers, made the batteau much more easy to handle than the pirogue. When operated by only two men it was usually managed with paddles and setting-poles;<sup>5</sup> some of the larger ones were supplied with oars and were rowed by eighteen or twenty men;<sup>6</sup> and in a few instances the batteau had a mast and a lug or sort of square sail which could be set when the wind favored.<sup>7</sup>

These pirogues and batteaux answered the early demand of local commerce, but for longer journeys, where increased dangers were to be met with and where it was not profitable to carry small cargoes, larger and more durable boats were needed. This need was met temporarily by the enlargement of the batteaux and by improvements in their plan of construction. In order to give greater height and width to the batteaux, slabs of timber were sometimes added to the sides and several planks instead of one were inserted into the bottom of the boat. These were at first stitched in by means of cords or sinews. Gradu-

bases his belief upon the statement that De Soto constructed four large pirogues to carry his expedition across the Mississippi. Nevertheless, the French were the first to use this form of boat for any extended time.

<sup>3</sup> Hall, *Sketches of the West*, 218.

<sup>4</sup> Harris, *Tour into the Northwest*, 341.

<sup>5</sup> *Ibid.*, 341.

<sup>6</sup> Pittman, *European Settlements*, 36.

<sup>7</sup> Cuming, *Tour into the Western Country*, 88.

ally, as the number of side planks increased, the solid hull diminished, and finally dwindled into a bottom board or keel at the bottom of the boat, its only purpose being to serve as a center piece upon which the sides of the vessel were built. Hence the name given to this form—the keel-boat. Finally the framework of vertical ribs was added to the interior and fastened to the planks of the sides by cords. These cords were later replaced by wooden pins which in their turn gave way to iron nails or small bolts.

These Mississippi keel-boats developed into a form forty to sixty feet long and seven to ten feet wide.<sup>8</sup> They were sharp at both ends, with flat bottoms, and drew only about two feet of water.<sup>9</sup> This made it possible to navigate them near the shore, in going against the current of the stream, where the counter-currents or eddies could be made use of to aid in the progress of the boat. When they had no roof they were fitted with a narrow gangway just above the gunwale for the use of the boatmen as they poled or warped up the stream.<sup>10</sup> Sometimes something like a large box was raised over the boat. This served for a cover and left a narrow footpath on the outside all around.<sup>11</sup> In descending the river, these boats required but one hand to steer and four to row. The steersman plied a long oar which served as a rudder. To ascend the stream, more hands were needed in order to pole the boat against the current. The poles used for this purpose were iron tipped and at least eight feet long. The upward journey was a laborious one, progress being only about eight or ten miles per day. Occasionally a better system of propulsion was employed. Fortesque Cuming, while making a tour down the Mississippi, made note of a keel-boat propelled by horse power:

A keel of forty tons came to the landing at the same time we did. She was worked by a horizontal wheel, kept in motion by six horses going round in a circle on a gallery above the boat, by which are turned two cog-

<sup>8</sup> Claiborne, *Mississippi*, 537; Evans, *Pedestrious Tour*, 245; Cuming, *op. cit.*, 75.

<sup>9</sup> Flint, *Recollections of the Last Ten Years*, 109.

<sup>10</sup> Claiborne, *op. cit.*, 537.

<sup>11</sup> Flint, *op. cit.*, 110.

wheels fixed each to an axle which projects over the gunwales of the boat, one before, the other behind the horizontal wheel. Eight paddles are fixed on the projecting ends of each axle, which propell the boat five or six miles an hour. . . . Seven horses died during the voyage, and he had only two remaining of the first set he commenced with.<sup>12</sup>

The next change in the keel-boat was not so much a change in its form as in the method of propelling it. The new form, constructed with a hull similar to that of the older type, had two masts and was provided with sails. Such a boat was called a barge. The advantages of the sail barge are easily understood when it is borne in mind that on the lower Mississippi, during the summer, there is always a south or southwest wind for nine or ten hours during the day, commencing about eight o'clock in the morning.<sup>13</sup> These barges were steered by a rudder and were easily managed when they were making good progress with a strong wind; but when they were descending the river with the force of the current alone, they were not so easily managed as was the keel-boat with its long steering oar. In case the wind was not favorable when ascending the stream, the navigation of these barges depended chiefly upon the use of the tow-line.

Leaving for a time the discussion of boats evolved from the canoe, we turn to a consideration of rafts and their modifications. It is evident that the idea of a raft would be as easily suggested to the mind of the savage as would that of the dug-out canoe; yet rafts were not in general use by the Indians of the Mississippi Valley at the time of its discovery by the Europeans. It was not until settlements had been made at New Orleans and at other points in the lower part of this great valley that this means of transportation became common.

As soon as such settlements were made, many of the early comers to the timber regions bordering the Mississippi and its tributaries employed themselves and their slaves in the autumn in cutting down and squaring timber for sawing into boards and scantling. These squared timbers were made into rafts and floated down the various feeders of the Mississippi, thence to be

<sup>12</sup> Cuming, *op. cit.*, 264.

<sup>13</sup> *Ibid.*, 290; Woods, *Settlement of the English Prairie*, 247-48.

carried to New Orleans or some other down-river settlement.<sup>14</sup> Many such settlers constructed their own water-power sawmills, or became partners in a neighborhood sawmill, which they put to good use during the period of high water. Large quantities of this lumber were rafted to New Orleans, there to be loaded upon ocean vessels for shipment to the West Indies or to other markets.<sup>15</sup>

This trade in lumber alone was profitable but it was early seen that these rafts could be made to carry more than their own weight. Consequently they were loaded with skins, produce, and peltries. This method of marketing other produce than lumber was not followed long. Modifications were made in the rafts to accommodate loose articles. One of the first of these was the lashing of two pirogues together to serve as a sort of foundation upon which was constructed a platform of planks or timbers. Besides the deck thus formed for the deposit of articles bound for market the boatmen had covered stowage in each of the pirogues.<sup>16</sup>

Experience soon taught those who made use of the ordinary raft, or of the form just described, that, with the dip of the raft in eddies, or with the shock which the raft received whenever it came in contact with snags or hidden boulders, much of the cargo would be precipitated into the river. In order to prevent this, rude sides a few feet high were fastened to the raft: here we have the first form of the flat-boat or

<sup>14</sup> Pittman, *op. cit.*, 59-60.

<sup>15</sup> *Ibid.*, 60.

<sup>16</sup> Morris Birkbeck, in a letter written March 18, 1818, says: "We are forming two pirogues out of large poplars, with which we propose to navigate the Wabash. By lashing them together, and laying planks across both, we shall have a roomy deck, besides good covered stowage in both, and take a bulky as well as a heavy cargo."—Birkbeck, *Letters from Illinois*, 84.

H. M. Brackenridge, *Journal of a Voyage up the Missouri in 1811*, says: "We met a large party of traders in two canoes lashed together, and a platform raised above them, constituting what is called a raft. This was heavily laden with buffalo robes."

This form of raft was in use in other parts of the Mississippi Valley before the time mentioned here, but in each of these examples a new colony was just being started and sufficient time had not elapsed for the appearance of the more modern means of conveyance.

"broad-horn." As Claiborne has said in the description of these craft: "The only claim of the flat-boat or 'broad-horn' to rank as a vessel was due to the fact that it floated upon the water and was used as a vehicle of transportation."<sup>17</sup>

At first these boats were constructed without nails, the parts being fastened together with thongs or wooden pins.<sup>18</sup> This made their use dangerous to the boatmen and hazardous to their cargoes because of the risk of their breaking up when they came in contact with the bank of the stream or with any obstacle to the progress of the boat. The material used in the construction of the early flat-boats differed but little from that used in the construction of the ordinary rafts. They have been compared in form to a log house with a puncheon floor, and with the roof and all but a few feet of the walls removed. Much grain and many small articles were lost whenever the water washed the plaster away from the chinks in the floor and in the low sides.<sup>19</sup>

The appearance of these boats was anything but graceful. They were usually about sixty feet long and twenty feet wide.<sup>20</sup> Their awkward shape and great size made them so unmanageable that an early traveler has undoubtedly expressed the truth when he says that "only the strong arm of a back-woodsman could keep them from running upon planters, sawyers, wooden-islands, and all the Scyllas and Charybdes that are to be met with on the voyage."<sup>21</sup> They were used to carry all sorts of bulky cargoes, including live stock and produce, and slaves as well. The following quotation taken from the account of a voyage down the Mississippi, gives some idea of the nature of the heterogeneous cargoes:

<sup>17</sup> Claiborne, *op. cit.*, 537.

<sup>18</sup> Ogg, *Fordham's Personal Narrative*, 79; Collot, *Journey in North America*, 33.

<sup>19</sup> Collot, *op. cit.*, 33.

<sup>20</sup> Gould in his *Fifty Years on the Mississippi*, 209, mentions a hay-boat built in the manner described, which was one hundred and fifty feet long and twenty-four feet wide. This boat was capable of carrying three hundred tons of hay.

<sup>21</sup> Anon., *Present State of Louisiana*, 108.

We found numbers of them [flat-boats] along the Ohio, detained by low water; and from St. Louis down to New Orleans, sometimes fifteen, twenty, and thirty together. . . . One of the flat-boats is from the Upper Ohio, laden with pine boards, planks, rye, whiskey, and flour; close to it, another from the Falls of the Ohio, with corn in the ear and bulk, apples, and peaches; a third with hemp, tobacco, and cotton. In the fourth, you may find horses regularly stabled together; in the next, cattle from the mouth of the Missouri; a sixth will have hogs, poultry, turkeys; and in a seventh, you see peeping out of the holes the wooley heads of slaves transported from Virginia and Kentucky to the human flesh mart at New Orleans. They have come thousands of miles, and still have to proceed a thousand more, before they arrive at their place of destination.<sup>22</sup>

The flat-boat traffic, except that of the Lower Mississippi, was confined to a few months in the year. The boats could float down the rivers only during the season of high water.<sup>23</sup> Traffic was confined to the down-river trade, as none of these craft ever attempted to go up the stream. They were generally broken up at their destination and the lumber of which they were made was sold for building purposes or for fuel. Whenever the market for the sale of such lumber was flooded, the boats were abandoned after they had been divested of their produce. Some were used by boat companies and by merchants to aid in the construction of their rude levees and wharves.

These boats depended mainly upon the strength of the current for power. Thomas Nuttall, in his *Journal of Travels into Arkansas Territory, during the Year 1819*, gives the speed at which he traveled in a flat-boat as follows:

We traveled all night . . . and before the expiration of twenty-four hours, . . . the current alone had carried us without labor near twenty miles! We accompanied another vessel of the same kind, and for mutual convenience, our boats, according to custom, were lashed together side by side, thus also facilitating our progress by obtaining a greater scope of the current.<sup>24</sup>

<sup>22</sup> *Ibid.*, 108-9.

<sup>23</sup> Gould, *op. cit.*, 211; Hinsdale, *Old Northwest*, 390. These boats arrived at New Orleans usually some time in January or February.

<sup>24</sup> Nuttall, *Journal of Travels into Arkansas Territory*, 67-68. It seems an unusual statement that the lashing of the boats should facilitate their progress, as most of the travelers state that these boats were each made as wide as the current of the stream and the width of the water courses would permit.

Such boats were lashed together as a means of protection against common enemies and for the purpose of bartering and obtaining supplies from each other.<sup>25</sup> Large oars were also used in the propulsion of the flat-boats and especially to aid in keeping them in the current. The rowers were commonly new immigrants from the various countries of Europe who had found their way across the eastern mountains to the headwaters of the Ohio or of other streams tributary to the Mississippi, and who wished to be transported down the rivers. They were hired for very low wages, often receiving merely a free passage and their keep.<sup>26</sup>

Timothy Flint, writing in 1826, said that at that time it was quite common to see a flat-boat propelled by means of a bucket-wheel worked by means of horse power. This, and the many other contrivances in use by the boatmen to aid the current in carrying the flat-boats, he ascribes to "the result of the farmer's meditation over his winter's fire."<sup>27</sup> The system of towing flat-boats by steamers was first tried in the year 1829 and was a financial success but it did not meet with the favor of the professional boatmen.<sup>28</sup>

The flat-boat, whether constructed of rough logs or of sawed plank, being usually uncovered, had many disadvantages which were especially prominent during periods of inclement weather. As one traveler, after trying one of these boats, said of it, "It is proof against the river but not against the rain."<sup>29</sup> The few loose boards which had been used to protect the boatmen now developed into a roof, covering the whole or part of the boat. Thus modified, the flat-boat was given the familiar name of ark. The floors of some of the better arks consisted of sills like those of a house, to which was trunnelleed a floor of planks.<sup>30</sup>

These arks were often given special names according to the

<sup>25</sup> Flint, *op. cit.*, 104; Nuttall, *op. cit.*, 71.

<sup>26</sup> Maximillian, *Travels in the Interior of North America*, 151.

<sup>27</sup> Flint, *op. cit.*, 105.

<sup>28</sup> Gould, *op. cit.*, 215; Maximillian, 202-3.

<sup>29</sup> Hulme, *Journal of a Tour in the Western Countries of America*, 38.

<sup>30</sup> Ogg, *Opening of the Mississippi*, 80.

place from which they came, to which they were bound, or according to the kind of cargo which they carried. There was usually some difference in their construction because of the conditions peculiar to the waters through which they came,<sup>31</sup> or because of the nature of their cargoes. The Kentucky boats were probably as common as any. They were constructed from twenty to fifty feet long, and from ten to fourteen feet wide. The foundation was built of solid timbers and, before the sides and roof were added, it resembled very much the ordinary dry dock except that the front part of the bow extended out ahead of the remainder of the boat, as in a ship's rake. The gunwales were usually one or two feet high, and from three to six inches thick. On the top of the gunwales square joists three or four feet long and several inches thick were mortised. These joists were then sided up with ordinary boards. On the top of these joists was secured the foot of each rafter, over which the roof was laid. This roof had another purpose also: that of being at the same time the main and quarter deck.<sup>32</sup> The New Orleans boats resembled the Kentucky boats, but they were larger and stronger, and had arched roofs.<sup>33</sup> Other names applied to these craft were Arkansas boats, tobacco boats,<sup>34</sup> cattle or horse boats, and simply "boxes."

These arks were much used as "family" boats. John Bradbury, in a letter advising some of his friends as to the best method

<sup>31</sup> Bradbury, *Travels in the Interior of America*, 301, says: "It often happens that they [arks on the Ohio] must pass over the falls at Louisville, when the river is at a low state, at which time they must pass between two rocks in the Indian chute, only fifteen feet asunder." (There were regular pilots resident at Louisville, who conducted the boats over the falls and delivered them safely at Shippingsport.)

F. A. Michaux, *Travels West of the Alleghany Mountains*, 166, says: "The amazing rapidity of the Ohio has an influence on the shape of the boats that navigate it, and that shape is not calculated to accelerate their progress, but to stem the current of the stream."

<sup>32</sup> Schultz, *Travels on an Inland Voyage*, I, 129-32.

<sup>33</sup> Boggess, *The Settlement of Illinois, 1778-1830*.

<sup>34</sup> Samuel S. Forman, *Down the Ohio and Mississippi in 1780*: "Tobacco boats are flat-bottomed, and boarded over the top, and prepared like floating houses."

of traveling on the Ohio and the Mississippi rivers, said: "One of the best modes of proceeding will be to inquire for one or more families who are going to the same neighborhood as yourself, who may join you in the purchase of an ark, one of the kind of vessels in which families descend."<sup>35</sup> When such use was contemplated, a large and roomy ark was provided. It was then made into separate apartments, some of which were fitted with chairs, beds, tables, stoves, and other furniture. Sometimes, instead of a stove, the voyagers had a rude fireplace in one end of the boat; at other times, fire for purposes of cooking was kept in a large box filled with earth and placed on the roof of the ark.<sup>36</sup> Besides the family or families, their furniture and servants, these arks carried cattle, horses, hogs, sheep, fowls, and other animals, farming utensils, grain, and, in short, all of the valuable belongings of the occupants of the boats.<sup>37</sup> Arks were propelled, like the flat-boats, chiefly by the current of the stream. On the deck of the ark were two large oars which moved on pivots, and at the stern was a large steering oar. The former were seldom used except for the purpose of rowing ashore. At times, when the boat was heavily laden, they were used to keep it in the middle of the stream.

These arks were made to serve many strange purposes. Sometimes they were used as workshops for men engaged in making shingles.<sup>38</sup> Some of them presented the appearance of the small country store of today, having shelves around the sides loaded with the articles which met the most ready market in this western region.<sup>39</sup> Another common spectacle was the floating tinshop

<sup>35</sup> Bradbury, *op. cit.*, 301.

<sup>36</sup> James Flint, *Letters from America*, 110.

<sup>37</sup> *Ibid.*, 13-14; Boggess, *op. cit.*, 94-95; F. A. Michaux, *op. cit.*, 166. One writer (Flint) adds: "It was no uncommon thing to see the wagons, ploughs, and other agricultural implements lying on the roof of the boat."

<sup>38</sup> Flint, *Letters from America*, 163: "In a boat lying ashore today, a man was busy making shingles. He has brought with him pine timber from the Alleghany River. Shingles have a good price here, where pine trees do not grow, and they furnish him with employment at intervals." (Flint wrote this communication from Louisville, Kentucky.)

<sup>39</sup> Cuming, *op. cit.*, 98-99.

where the boatmen-tinmen mended old ware as well as sold new utensils.<sup>40</sup> These examples could easily be multiplied, but one more illustration will suffice. H. L. Ellsworth says: "Sometimes also they are used as museums of wax-figures, and other raree-shows, or for traveling libraries."<sup>41</sup>

The coming of the steamboat meant ultimately a diminution in the relative amount of the traffic carried by these arks and flat-boats, but for a considerable time after the steamboat came into general use on the western rivers, these cruder boats were used in the less settled parts of the country and in the shallower streams where the steamboat could not have access. Many of the earlier farmers had so much leisure time in the autumn that it paid them to make their own means of transporting their produce to market.<sup>42</sup> Then, too, it was the keel-boat and the barge and not the flat-boat and the ark which were supplanted by the steamboat; the two former attempted to compete with the steamer in carrying up-stream traffic, while the ark and the flat-boat supplemented the work of this new craft, especially in the systems of towage which came in with the large shipments of coal to the down-river ports. The so-called "barge," which then became so common, was but little different in form from the earlier flat-boat.

As stated previously, the third type of boat employed in the Mississippi Valley before the coming of the steamboat was an introduction from the East rather than a western invention. As early as 1777, the desire of those who needed a means of conveyance down the Ohio River to avoid the delay occasioned by waiting at Pittsburgh (then called Fort Pitt) until they could build their own boats led several professional boat-builders to remove to that place from eastern ports.<sup>43</sup> With the increase of this demand, caused by the greater immigration

<sup>40</sup> Flint, *Letters from America*, 105.

<sup>41</sup> Ellsworth, *Illinois in 1837*, 30.

<sup>42</sup> Shirreff, *A Tour Through North America*, 271-72.

<sup>43</sup> *Magazine of Western History*, II, 259: "There arrived at this town [Fort Pitt] fourteen boat carpenters and sawyers from Philadelphia, and were set to work on the Monongahela, fourteen miles from the fort, near a sawmill."

to the West following the close of the Revolutionary War, boat-building became an important branch of western enterprise and attracted many of the best craftsmen engaged in this business on the Atlantic seaboard. Some of the more far-seeing and enterprising of these men conceived the idea that ocean-going vessels could be constructed with profit along these western rivers and used to carry the produce of the Mississippi Valley to eastern ports or to the markets of the West Indies.<sup>44</sup>

By the opening of the nineteenth century a sea-going vessel capable of carrying one hundred tons burden was constructed at Marietta, Ohio, loaded with the produce of the surrounding country, and sent out to the West Indies.<sup>45</sup> Within eight years twenty-three other such vessels were built and fitted out at the same place.<sup>46</sup> The early boats of this type, however, did not meet with marked success, because, being constructed after the model of the ocean craft of the time, their holds were so deep as to make their navigation perilous to cargo and crew alike, owing to the many obstructions in the western rivers. This difficulty was in time overcome by making such boats broader and flatter. For power, some of them were fitted with sails; but, for the most part, they depended, like the keel-boat, upon the current of the stream. Large numbers of these boats did not attempt to return to the place from whence they started but were sold at New Orleans or at other points of destination.<sup>47</sup>

Thus we have attempted to trace the development of the means of transportation on the Mississippi River before the introduction of the steamboat and to show that the types of boats used were, at least to a very large degree, products of the West. We cannot make this claim for the steamboat, although some of the efforts put forth to utilize other forces than wind and

<sup>44</sup> In a letter written December 18, 1796, Andrew Ellicott makes the following statement: "Vessels proper for the West India trade may be advantageously built on the Ohio, and taken with a cargo every annual rise of the waters down to New Orleans, or out to the islands. The experiment has already been made, and attended with success."—*Journals of Andrew Ellicott*, 25.

<sup>45</sup> Cist, *Cincinnati in 1841*, 181.

<sup>46</sup> *Magazine of Western History*, II, 261.

<sup>47</sup> Evans, *op. cit.*, 269.

current in the propulsion of Mississippi River boats might ultimately have resulted in the steamboat as a western invention.<sup>48</sup> The early steamboat, however, met with the same difficulties as did the early boats meant for the West India trade, and it was not until after the former had been constructed to accord with the conditions peculiar to these western rivers that steamboat navigation attained success here. Hence we may say that, in so far as the steam vessels were adapted to the current, the depth, and the windings of the Mississippi River, they, too, were but a forward step in the development of the earlier craft and, as such, properly belong in the list of those boats which we have called products of the West.

H. E. HOAGLAND

MADISON, WIS.

<sup>48</sup> We may cite one example of such efforts. The following page, taken from the diary of James Kenny, a fur trader at Fort Pitt, was dated April 4, 1761: "A young man, called William Ramsey, has made two little boates, being squair at ye sterns and joined together at ye sterns by a swivel make ye two in ye form of one boate, but will turn around shorter than a boat of ye same length or raise with more safety in falls and in case of striking rocks; he has also made an engine that goes with wheels, closed in a box, to be worked by one man, by sitting on ye end of ye box, and tredding on treddles at bottom with his feet, sets ye wheels agoing which work scullers at short paddles fixed over ye gunnels, turning them round; ye under ones, always laying hold on ye water, will make ye boates goe as if two men rowed; and he can steer at ye same time by lines, like plow lines."—*Magazine of Western History*, II, 259. This boat was, without doubt, the first "side-wheeler" on the Mississippi River.